Abstract

Improvements are disclosed for *in vitro* selection methods that yield ligands and catalysts through partitioning libraries of oligonucleotides. These improvements all increase the diversity and amount of fuctionality available to the oligonucleotides, by incorporating into the oligonucleotide libraries non-standard nucleobase analogs and/or functionalized standard nucleobases, and/or incorporating into the selection mixture organic cofactors that deliver functional groups by binding non-covalently to oligonucleotides in the library.